

RAW SEQUENCE LISTING

The Biotechnology Systems Branch of the Scientific and Technical
Information Center (STIC) no errors detected.

Application Serial Number: 10/696,708 A
Source: IFWO
Date Processed by STIC: 10/14/04

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IFWO

RAW SEQUENCE LISTING

DATE: 10/14/2004

PATENT APPLICATION: US/10/696,708A

TIME: 10:52:22

Input Set : A:\164seqlist.txt

Output Set: N:\CRF4\10142004\J696708A.raw

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3 <110> APPLICANT: Keating, Mark T.
4   Splawski, Igor
6 <120> TITLE OF INVENTION: MUTATIONS IN AND GENOMIC STRUCTURE OF HERG - A LONG QT
7   SYNDROME GENE
9 <130> FILE REFERENCE: 2323-164
C--> 11 <140> CURRENT APPLICATION NUMBER: US/10/696,708A
C--> 12 <141> CURRENT FILING DATE: 2003-10-30
14 <150> PRIOR APPLICATION NUMBER: US 09/735,995
15 <151> PRIOR FILING DATE: 2000-12-14
17 <150> PRIOR APPLICATION NUMBER: US 09/226,012
18 <151> PRIOR FILING DATE: 1999-01-06
20 <150> PRIOR APPLICATION NUMBER: 09/122,847
21 <151> PRIOR FILING DATE: 1998-07-27
23 <160> NUMBER OF SEQ ID NOS: 116
25 <170> SOFTWARE: PatentIn Ver. 2.0
27 <210> SEQ ID NO: 1
28 <211> LENGTH: 3480
29 <212> TYPE: DNA
30 <213> ORGANISM: Homo sapiens
32 <220> FEATURE:
33 <221> NAME/KEY: CDS
34 <222> LOCATION: (1)..(3477)
36 <400> SEQUENCE: 1
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38 Met Pro Val Arg Arg Gly His Val Ala Pro Gln Asn Thr Phe Leu Asp
39   1           5           10           15
41 acc atc atc cgc aag ttt gag ggc cag agc cgt aag ttc atc atc gcc   96
42 Thr Ile Ile Arg Lys Phe Glu Gly Gln Ser Arg Lys Phe Ile Ile Ala
43   20           25           30
45 aac gct cgg gtg gag aac tgc gcc gtc atc tac tgc aac gac ggc ttc   144
46 Asn Ala Arg Val Glu Asn Cys Ala Val Ile Tyr Cys Asn Asp Gly Phe
47   35           40           45
49 tgc gag ctg tgc ggc tac tcg cgg gcc gag gtg atg cag cga ccc tgc   192
50 Cys Glu Leu Cys Gly Tyr Ser Arg Ala Glu Val Met Gln Arg Pro Cys
51   50           55           60
53 acc tgc gac ttc ctg cac ggg ccg cgc acg cag cgc cgc gct gcc gcg   240
54 Thr Cys Asp Phe Leu His Gly Pro Arg Thr Gln Arg Arg Ala Ala Ala
55   65           70           75           80
57 cag atc gcg cag gca ctg ctg ggc gcc gag gag cgc aaa gtg gaa atc   288
58 Gln Ile Ala Gln Ala Leu Leu Gly Ala Glu Glu Arg Lys Val Glu Ile
59   85           90           95
61 gcc ttc tac cgg aaa gat ggg agc tgc ttc cta tgt ctg gtg gat gtg   336
62 Ala Phe Tyr Arg Lys Asp Gly Ser Cys Phe Leu Cys Leu Val Asp Val

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63																	100																	105																	110																
65	gtg	ccc	gtg	aag	aac	gag	gat	ggg	gct	gtc	atc	atg	ttc	atc	ctc	aat	384																																																		
66	Val	Pro	Val	Lys	Asn	Glu	Asp	Gly	Ala	Val	Ile	Met	Phe	Ile	Leu	Asn																																																			
67	115																120																125																																		
69	ttc	gag	gtg	gtg	atg	gag	aag	gac	atg	gtg	ggg	tcc	ccg	gct	cat	gac	432																																																		
70	Phe	Glu	Val	Val	Met	Glu	Lys	Asp	Met	Val	Gly	Ser	Pro	Ala	His	Asp																																																			
71	130																135																140																																		
73	acc	aac	cac	cgg	ggc	ccc	ccc	acc	agc	tgg	ctg	gcc	cca	ggc	cgc	gcc	480																																																		
74	Thr	Asn	His	Arg	Gly	Pro	Pro	Thr	Ser	Trp	Leu	Ala	Pro	Gly	Arg	Ala																																																			
75	145																150																155																160																		
77	aag	acc	ttc	cgc	ctg	aag	ctg	ccc	gcg	ctg	ctg	gcg	ctg	acg	gcc	cgg	528																																																		
78	Lys	Thr	Phe	Arg	Leu	Lys	Leu	Pro	Ala	Leu	Leu	Ala	Leu	Thr	Ala	Arg																																																			
79	165																170																175																																		
81	gag	tcg	tcg	gtg	cgg	tcg	ggc	ggc	gcg	ggc	gcg	ggc	gcc	ccg	ggg		576																																																		
82	Glu	Ser	Ser	Val	Arg	Ser	Gly	Gly	Ala	Gly	Gly	Ala	Gly	Ala	Pro	Gly																																																			
83	180																185																190																																		
85	gcc	gtg	gtg	gtg	gac	gtg	gac	ctg	acg	ccc	gcg	gca	ccc	agc	agc	gag	624																																																		
86	Ala	Val	Val	Val	Asp	Val	Asp	Leu	Thr	Pro	Ala	Ala	Pro	Ser	Ser	Glu																																																			
87	195																200																205																																		
89	tcg	ctg	gcc	ctg	gac	gaa	gtg	aca	gcc	atg	gac	aac	cac	gtg	gca	ggg	672																																																		
90	Ser	Leu	Ala	Leu	Asp	Glu	Val	Thr	Ala	Met	Asp	Asn	His	Val	Ala	Gly																																																			
91	210																215																220																																		
93	ctc	ggg	ccc	gcg	gag	gag	cgg	cgt	gcg	ctg	gtg	ggt	ccc	ggc	tct	ccg	720																																																		
94	Leu	Gly	Pro	Ala	Glu	Glu	Arg	Arg	Ala	Leu	Val	Gly	Pro	Gly	Ser	Pro																																																			
95	225																230																235																240																		
97	ccc	cgc	agc	gcg	ccc	ggc	cag	ctc	cca	tcg	ccc	cgg	gcg	cac	agc	ctc	768																																																		
98	Pro	Arg	Ser	Ala	Pro	Gly	Gln	Leu	Pro	Ser	Pro	Arg	Ala	His	Ser	Leu																																																			
99	245																250																255																																		
101	aac	ccc	gac	gcc	tcg	ggc	tcc	agc	tgc	agc	ctg	gcc	cgg	acg	cgc	tcc	816																																																		
102	Asn	Pro	Asp	Ala	Ser	Gly	Ser	Ser	Cys	Ser	Leu	Ala	Arg	Thr	Arg	Ser																																																			
103	260																265																270																																		
105	cga	gaa	agc	tgc	gcc	agc	gtg	cgc	cgc	gcc	tcg	tcg	gcc	gac	gac	atc	864																																																		
106	Arg	Glu	Ser	Cys	Ala	Ser	Val	Arg	Arg	Ala	Ser	Ser	Ala	Asp	Asp	Ile																																																			
107	275																280																285																																		
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111	290																295																300																																		
113	acc	ggg	gcc	atg	cac	cca	ctg	cgc	agc	ggc	ttg	ctc	aac	tcc	acc	tcg	960																																																		
114	Thr	Gly	Ala	Met	His	Pro	Leu	Arg	Ser	Gly	Leu	Leu	Asn	Ser	Thr	Ser																																																			
115	305																310																315																320																		
117	gac	tcc	gac	ctc	gtg	cgc	tac	cgc	acc	att	agc	aag	att	ccc	caa	atc	1008																																																		
118	Asp	Ser	Asp	Leu	Val	Arg	Tyr	Arg	Thr	Ile	Ser	Lys	Ile	Pro	Gln	Ile																																																			

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131		370					375					380					
133	ctg	cct	gag	tac	aag	ctg	cag	gca	ccg	cgc	atc	cac	cgc	tgg	acc	atc	1200
134	Leu	Pro	Glu	Tyr	Lys	Leu	Gln	Ala	Pro	Arg	Ile	His	Arg	Trp	Thr	Ile	
135	385					390					395					400	
137	ctg	cat	tac	agc	ccc	ttc	aag	gcc	gtg	tgg	gac	tgg	ctc	atc	ctg	ctg	1248
138	Leu	His	Tyr	Ser	Pro	Phe	Lys	Ala	Val	Trp	Asp	Trp	Leu	Ile	Leu	Leu	
139					405					410					415		
141	ctg	gtc	atc	tac	acg	gct	gtc	ttc	aca	ccc	tac	tgc	gct	gcc	ttc	ctg	1296
142	Leu	Val	Ile	Tyr	Thr	Ala	Val	Phe	Thr	Pro	Tyr	Ser	Ala	Ala	Phe	Leu	
143				420					425					430			
145	ctg	aag	gag	acg	gaa	gaa	ggc	ccg	cct	gct	acc	gag	tgt	ggc	tac	gcc	1344
146	Leu	Lys	Glu	Thr	Glu	Glu	Gly	Pro	Pro	Ala	Thr	Glu	Cys	Gly	Tyr	Ala	
147			435					440					445				
149	tgc	cag	ccg	ctg	gct	gtg	gtg	gac	ctc	atc	gtg	gac	atc	atg	ttc	att	1392
150	Cys	Gln	Pro	Leu	Ala	Val	Val	Asp	Leu	Ile	Val	Asp	Ile	Met	Phe	Ile	
151		450					455					460					
153	gtg	gac	atc	ctc	atc	aac	ttc	cgc	acc	acc	tac	gtc	aat	gcc	aac	gag	1440
154	Val	Asp	Ile	Leu	Ile	Asn	Phe	Arg	Thr	Thr	Tyr	Val	Asn	Ala	Asn	Glu	
155	465					470					475					480	
157	gag	gtg	gtc	agc	cac	ccc	ggc	cgc	atc	gcc	gtc	cac	tac	ttc	aag	ggc	1488
158	Glu	Val	Val	Ser	His	Pro	Gly	Arg	Ile	Ala	Val	His	Tyr	Phe	Lys	Gly	
159					485					490					495		
161	tgg	ttc	ctc	atc	gac	atg	gtg	gcc	gcc	atc	ccc	ttc	gac	ctg	ctc	atc	1536
162	Trp	Phe	Leu	Ile	Asp	Met	Val	Ala	Ala	Ile	Pro	Phe	Asp	Leu	Leu	Ile	
163				500					505					510			
165	ttc	ggc	tct	ggc	tct	gag	gag	ctg	atc	ggg	ctg	ctg	aag	act	gcg	cgg	1584
166	Phe	Gly	Ser	Gly	Ser	Glu	Glu	Leu	Ile	Gly	Leu	Leu	Lys	Thr	Ala	Arg	
167			515					520					525				
169	ctg	ctg	cgg	ctg	gtg	cgc	gtg	gcg	cgg	aag	ctg	gat	cgc	tac	tca	gag	1632
170	Leu	Leu	Arg	Leu	Val	Arg	Val	Ala	Arg	Lys	Leu	Asp	Arg	Tyr	Ser	Glu	
171		530				535						540					
173	tac	ggc	gcg	gcc	gtg	ctg	ttc	ttg	ctc	atg	tgc	acc	ttt	gcg	ctc	atc	1680
174	Tyr	Gly	Ala	Ala	Val	Leu	Phe	Leu	Leu	Met	Cys	Thr	Phe	Ala	Leu	Ile	
175	545					550					555					560	
177	gcg	cac	tgg	cta	gcc	tgc	atc	tgg	tac	gcc	atc	ggc	aac	atg	gag	cag	1728
178	Ala	His	Trp	Leu	Ala	Cys	Ile	Trp	Tyr	Ala	Ile	Gly	Asn	Met	Glu	Gln	
179					565					570					575		
181	cca	cac	atg	gac	tca	cgc	atc	ggc	tgg	ctg	cac	aac	ctg	ggc	gac	cag	1776
182	Pro	His	Met	Asp	Ser	Arg	Ile	Gly	Trp	Leu	His	Asn	Leu	Gly	Asp	Gln	
183				580					585					590			
185	ata	ggc	aaa	ccc	tac	aac	agc	agc	ggc	ctg	ggc	ggc	ccc	tcc	atc	aag	1824
186	Ile	Gly	Lys	Pro	Tyr	Asn	Ser	Ser	Gly	Leu	Gly	Gly	Pro	Ser	Ile	Lys	
187			595					600					605				
189	gac	aag	tat	gtg	acg	gcg	ctc	tac	ttc	acc	ttc	agc	agc	ctc	acc	agt	1872
190	Asp	Lys	Tyr	Val	Thr	Ala	Leu	Tyr	Phe	Thr	Phe	Ser	Ser	Leu	Thr	Ser	
191		610					615					620					
193	gtg	ggc	ttc	ggc	aac	gtc	tct	ccc	aac	acc	aac	tca	gag	aag	atc	ttc	1920

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198 Ser Ile Cys Val Met Leu Ile Gly Ser Leu Met Tyr Ala Ser Ile Phe
199                      645                      650                      655
201 ggc aac gtg tgc gcc atc atc cag cgg ctg tac tgc ggc aca gcc cgc 2016
202 Gly Asn Val Ser Ala Ile Ile Gln Arg Leu Tyr Ser Gly Thr Ala Arg
203                      660                      665                      670
205 tac cac aca cag atg ctg cgg gtg cgg gag ttc atc cgc ttc cac cag 2064
206 Tyr His Thr Gln Met Leu Arg Val Arg Glu Phe Ile Arg Phe His Gln
207                      675                      680                      685
209 atc ccc aat ccc ctg cgc cag cgc ctc gag gag tac ttc cag cac gcc 2112
210 Ile Pro Asn Pro Leu Arg Gln Arg Leu Glu Glu Tyr Phe Gln His Ala
211                      690                      695                      700
213 tgg tcc tac acc aac ggc atc gac atg aac gcg gtg ctg aag ggc ttc 2160
214 Trp Ser Tyr Thr Asn Gly Ile Asp Met Asn Ala Val Leu Lys Gly Phe
215 705                      710                      715                      720
217 cct gag tgc ctg cag gct gac atc tgc ctg cac ctg aac cgc tca ctg 2208
218 Pro Glu Cys Leu Gln Ala Asp Ile Cys Leu His Leu Asn Arg Ser Leu
219                      725                      730                      735
221 ctg cag cac tgc aaa ccc ttc cga ggg gcc acc aag ggc tgc ctt cgg 2256
222 Leu Gln His Cys Lys Pro Phe Arg Gly Ala Thr Lys Gly Cys Leu Arg
223                      740                      745                      750
225 gcc ctg gcc atg aag ttc aag acc aca cat gca ccg cca ggg gac aca 2304
226 Ala Leu Ala Met Lys Phe Lys Thr Thr His Ala Pro Pro Gly Asp Thr
227                      755                      760                      765
229 ctg gtg cat gct ggg gac ctg ctc acc gcc ctg tac ttc atc tcc cgg 2352
230 Leu Val His Ala Gly Asp Leu Leu Thr Ala Leu Tyr Phe Ile Ser Arg
231                      770                      775                      780
233 ggc tcc atc gag atc ctg cgg ggc gac gtc gtc gtg gcc atc ctg ggg 2400
234 Gly Ser Ile Glu Ile Leu Arg Gly Asp Val Val Val Ala Ile Leu Gly
235 785                      790                      795                      800
237 aag aat gac atc ttt ggg gag cct ctg aac ctg tat gca agg cct ggc 2448
238 Lys Asn Asp Ile Phe Gly Glu Pro Leu Asn Leu Tyr Ala Arg Pro Gly
239                      805                      810                      815
241 aag tgc aac ggg gat gtg cgg gcc ctc acc tac tgt gac cta cac aag 2496
242 Lys Ser Asn Gly Asp Val Arg Ala Leu Thr Tyr Cys Asp Leu His Lys
243                      820                      825                      830
245 atc cat cgg gac gac ctg ctg gag gtg ctg gac atg tac cct gag ttc 2544
246 Ile His Arg Asp Asp Leu Leu Glu Val Leu Asp Met Tyr Pro Glu Phe
247                      835                      840                      845
249 tcc gac cac ttc tgg tcc agc ctg gag atc acc ttc aac ctg cga gat 2592
250 Ser Asp His Phe Trp Ser Ser Leu Glu Ile Thr Phe Asn Leu Arg Asp
251                      850                      855                      860
253 acc aac atg atc ccg ggc tcc ccc ggc agt acg gag tta gag ggt ggc 2640
254 Thr Asn Met Ile Pro Gly Ser Pro Gly Ser Thr Glu Leu Glu Gly Gly
255 865                      870                      875                      880
257 ttc agt cgg caa cgc aag cgc aag ttg tcc ttc cgc agg cgc acg gac 2688
258 Phe Ser Arg Gln Arg Lys Arg Lys Leu Ser Phe Arg Arg Arg Thr Asp

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262	Lys Asp Thr Glu Gln Pro Gly Glu Val Ser Ala Leu Gly Pro Gly Arg							
263		900		905		910		
265	gcg ggg gca ggg ccg agt agc cgg ggc cgg ccg ggg ggg ccg tgg ggg							2784
266	Ala Gly Ala Gly Pro Ser Ser Arg Gly Arg Pro Gly Gly Pro Trp Gly							
267		915		920		925		
269	gag agc ccg tcc agt ggc ccc tcc agc cct gag agc agt gag gat gag							2832
270	Glu Ser Pro Ser Ser Gly Pro Ser Ser Pro Glu Ser Ser Glu Asp Glu							
271		930		935		940		
273	ggc cca ggc cgc agc tcc agc ccc ctc cgc ctg gtg ccc ttc tcc agc							2880
274	Gly Pro Gly Arg Ser Ser Ser Pro Leu Arg Leu Val Pro Phe Ser Ser							
275	945		950		955		960	
277	ccc agg ccc ccc gga gag ccg ccg ggt ggg gag ccc ctg atg gag gac							2928
278	Pro Arg Pro Pro Gly Glu Pro Pro Gly Gly Glu Pro Leu Met Glu Asp							
279		965		970		975		
281	tgc gag aag agc agc gac act tgc aac ccc ctg tca ggc gcc ttc tca							2976
282	Cys Glu Lys Ser Ser Asp Thr Cys Asn Pro Leu Ser Gly Ala Phe Ser							
283		980		985		990		
285	gga gtg tcc aac att ttc agc ttc tgg ggg gac agt cgg ggc cgc cag							3024
286	Gly Val Ser Asn Ile Phe Ser Phe Trp Gly Asp Ser Arg Gly Arg Gln							
287		995		1000		1005		
289	tac cag gag ctc cct cga tgc ccc gcc ccc acc ccc agc ctc ctc aac							3072
290	Tyr Gln Glu Leu Pro Arg Cys Pro Ala Pro Thr Pro Ser Leu Leu Asn							
291		1010		1015		1020		
293	atc ccc ctc tcc agc ccg ggt cgg cgg ccc cgg ggc gac gtg gag agc							3120
294	Ile Pro Leu Ser Ser Pro Gly Arg Arg Pro Arg Gly Asp Val Glu Ser							
295	1025		1030		1035		1040	
297	agg ctg gat gcc ctc cag cgc cag ctc aac agg ctg gag acc cgg ctg							3168
298	Arg Leu Asp Ala Leu Gln Arg Gln Leu Asn Arg Leu Glu Thr Arg Leu							
299		1045		1050		1055		
301	agt gca gac atg gcc act gtc ctg cag ctg cta cag agg cag atg acg							3216
302	Ser Ala Asp Met Ala Thr Val Leu Gln Leu Leu Gln Arg Gln Met Thr							
303		1060		1065		1070		
305	ctg gtc ccg ccc gcc tac agt gct gtg acc acc ccg ggg cct ggc ccc							3264
306	Leu Val Pro Pro Ala Tyr Ser Ala Val Thr Thr Pro Gly Pro Gly Pro							
307		1075		1080		1085		
309	act tcc aca tcc ccg ctg ttg ccc gtc agc ccc ctc ccc acc ctc acc							3312
310	Thr Ser Thr Ser Pro Leu Leu Pro Val Ser Pro Leu Pro Thr Leu Thr							
311		1090		1095		1100		
313	ttg gac tgc ctt tct cag gtt tcc cag ttc atg gcg tgt gag gag ctg							3360
314	Leu Asp Ser Leu Ser Gln Val Ser Gln Phe Met Ala Cys Glu Glu Leu							
315	1105		1110		1115		1120	
317	ccc ccg ggg gcc cca gag ctt ccc caa gaa ggc ccc aca cga cgc ctc							3408
318	Pro Pro Gly Ala Pro Glu Leu Pro Gln Glu Gly Pro Thr Arg Arg Leu							
319		1125		1130		1135		
321	tcc cta ccg ggc cag ctg ggg gcc ctc acc tcc cag ccc ctg cac aga							3456
322	Ser Leu Pro Gly Gln Leu Gly Ala Leu Thr Ser Gln Pro Leu His Arg							
323		1140		1145		1150		

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L:11 M:270 C: Current Application Number differs, Replaced Application Number

L:12 M:271 C: Current Filing Date differs, Replaced Current Filing Date